AMENDMENTS TO THE CLAIMS:

Claim 1 (original): A process for the specific oxygenation of an organic compound by contacting this compound with molecular oxygen in the presence of a cell-free microbial monooxygenase.

Claim 2 (original): The process of claim 1, wherein the oxygenation reaction comprises one of the reactions of Figure 2.

Claim 3 (currently amended): The process of claim 1 ~~claims 1-2~~, wherein the monooxygenase is supplied with necessary reduction equivalents by a reduced metal complex especially comprising Cyclopentadienyl bipyridyl rhodium complexes wherein one or both of the pyridine rings can be substituted.

Claim 4 (original): The process of claim 3, wherein the monooxygenase component is regenerated directly (Figure 1 and/or Figure 4) or at any point of its electron transport chain (e.g. replacing the NAD(P)H:acceptor oxidoreductase).

Claim 5 (currently amended): The process of claim 3 ~~claims 3-4~~, wherein the reduced complex is *in situ* regenerated either electrochemically or chemically.

Claim 6 (currently amended): The process of claim 3 ~~claims 3-4~~, wherein the reduction equivalents can be derived chemically either from formate or alcohols.

Claim 7 (currently amended): The process of claim 3 ~~claims 3-4~~, wherein the electrochemical supply with reduction equivalents is achieved from a cathode with a electrochemical potential in the range of -450 to -900 mV (vs. Ag/AgClsat.).

Claim 8 (original): The process of claim 7, wherein the enzyme is separated from the electrochemical cell via compartmentation (Figure 6).

Claim 9 (original): The process of claim 8, wherein the monooxygenase is retained from the electrochemical cell either by immobilization to a solid matrix within a plugged-flow-reactor or within a continuously stirred tank reactor or in an enzyme-membrane reactor.

Claim 10 (currently amended): The process of claim 7 ~~claim 7-9~~, wherein the oxygen supply for the biocatalyst is controllable so that at the efflux of the biocatalyst compartment the oxygen saturation is minimized.

Claim 11 (currently amended): The process of claim 1 ~~any one of claims 1-10~~, wherein a second phase, either solid or liquid is used during the reaction to extract any product as soon as it is formed to prevent product decay on in order to act as substrate reservoir.

Claim 12 (original): The process of claim 11, wherein to phase contact is established either by direct contact (e.g. emulsion) or with constant phase separation (e.g. by a hollow-fiber module).

Claim 13 (currently amended): The process of claim 1 ~~any of claims 1-12~~, wherein inactivation of either biocatalyst or metal complex is prevented either by utilization of nucleophilic buffer additives (e.g. NH_3 or TRIS) or by immobilization of the metal complex.

Claim 14 (currently amended): The process of claim 3 ~~claims 3-12~~, wherein the monooxygenase can contain FAD, or FMN, or heme-iron or non-heme-iron or any other metal as cofactor or prosthetic group.

Claim 15 (original): The process of claim 14, wherein the monooxygenase can be used for oxidation reactions such as:
a) oxidation of saturated, unsaturated aliphatic or aromatic carbon atoms, especially via hydroxylation, epoxidation or Baeyer-Villiger oxidation (insertion in C-C-bonds);
b) oxidation of heteroatoms from the groups III, V, VI, and VII within the substrate, especially oxidation of boron, nitrogen, phosphorous, sulfur, selenium, bromine, and iodine.

Claim 16 (original): A process for *in situ* generation of hydrogen peroxide coupled to an enzymatic reaction, preferably to a monooxygenase or a peroxidase for the oxidation of organic compounds.

Claim 17 (original): The process of claim 16, wherein the reduced metal complex acts on alloxazine moieties such as FAD or FMN in the presence of molecular oxygen to form hydrogen peroxide.

Claim 18 (canceled):

Claim 19 (original): A process of *in situ* regeneration of $NAD(P)^+$ from NAD(P)H.

Claim 20 (original): The process of claim 19, wherein the oxidized coenzyme is consumed as cosubstrate by a dehydrogenase within a oxidation reaction.

Claim 21 (currently amended): The process of claim 19 ~~claims 10-20~~,wherein a inorganic mediator such as $[Cp^*Rh(bpy)(H_20)]^{2+}$ is used to catalyze the transhydrogenation reaction from NAD(P)H to an alloxazine based acceptor such as FAD, FMN).

Claim 22 (currently amended): The process of claim 19 ~~claims 19-21~~, wherein the reduced acceptor is reoxidize3d either by molecular oxygen of by anodic oxidation.

Claim 23 (original): The process of claim 22, wherein the accumulation of hydrogen peroxide is prevented either by chemical or enzymatic dismutation.

Claim 24 (new): A process for *in situ* generation of hydrogen peroxide coupled to an enzymatic reaction, preferably to a monooxygenase or a perioxidase for the oxidation of organic compounds, wherein the monooxygenase is supplied with necessary reduction equivalents by a reduced metal complex especially comprising Cyclopentadienyl bipyridyl rhodium complexes wherein one or both of the pyridine rings can be substituted and wherein the monooxygenase component is regenerated directly (Figure 2 and/or Figure 4) or at any point of its electron transport chain (e.g. replacing the NAD(P)H: acceptor oxidoreductase).

Claim 25 (new): A process as in claim 24, wherein said reduced complex is regenerated *in situ* either electrochemically or chemically.

Claim 26 (new): A process as in claim 24, wherein said reduction equivalents can be derived chemically either from formate or alcohols.

Claim 27 (new): A process as in claim 24, wherein the electrochemical supply with reduction equivalents is achieved from a cathode with a an electrochemical potential in the range of -450 to -900 mV (vs. Ag/AgClsat.).

Claim 28 (new): A process as in claim 27, wherein the enzyme is separated from the electrochemical cell via compartmentation (Figure 6).

Claim 29 (new): A process as in claim 28, wherein the monooxygenase is retained from the electrochemical cell either by immobilization to a solid matrix within a plugged-slow-reactor or within a continuously stirred tank reactor or in an enzyme-membrane reactor.

Claim 30 (new): A process as in claim 24, wherein a second phase, either solid or liquid is used during the reaction to extract any product as soon as it is formed to present product decay on in order to act as substrate reservoir.

Claim 31 (new): A process according to claim 30, wherein to phase contact is established either by direct contact (e.g. emulsion) or with constant phase separation (e.g. by a hollow-fiber module).

Claim 32 (new): A process according to claim 24, wherein inactivation of either biocatalyst or metal complex is prevented either by utilization of nucleophilic buffer additives, e.g. NH_3 or TRIS) or by immobilization of the metal complex.

Claim 33 (new): A process according to claim 24 wherein the monooxygenase can contain FAD, or FMN, or heme-iron or non-heme-iron or any other metal as cofactor or prosthetic group.

Claim 34 (new): A process as in claim 33, wherein the monooxygenase can be used for oxidation reactions such as:
a) oxidation of saturated, unsaturated aliphatic or aromatic carbon atoms, especially via hydroxylation, epoxidation or Baeyer-Villiger oxidation (insertion in C-C-bonds);
b) oxidation of heteroatoms from the groups III, V, VI, and VII within the substrate, especially oxidation of boron, nitrogen, phosporous, sulfur, selenium, bromine and iodine.

Claim 35 (new): A process according to claim 24, wherein the reduced metal complex act on alloxazine moieties such as FAD or FMN in the presence of molecular oxygen to form hydrogen peroxide.